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<p>(54) Title: SHAMPOO COMPOSITION CONTAINING CAPSULES OR PARTICLES (57) Abstract The present invention relates to a shampoo composition containing encapsulated or particulated oily substances. Particularly, the shampoo composition of the present invention ensures the homogeneous dispersion and stability of such capsules or particles for long periods and provides excellent conditioning and esthetic effects for the hair.</p>		

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SHAMPOO COMPOSITION CONTAINING CAPSULES OR PARTICLES

5 BACKGROUND OF THE INVENTION

Field of the Invention

10 The present invention relates to a shampoo composition containing encapsulated or particulated oily substances. Particularly, the shampoo composition of the present invention ensures the homogeneous dispersion and stability of such capsules or particles for long periods and provides excellent conditioning and esthetic effects for the hair.

15 Description of the Prior Art

20 There are a variety of oily substances known as hair conditioning and esthetic agents, including mineral, animal and plant oils. However, due to their physicochemical properties, such oily substances are inconvenient for general use and application. Once such substances are incorporated into a shampoo, they are not readily applicable to the shampoo system and thus adversely effect the intrinsic performance of the shampoo, rather imparting the desired physical and esthetic properties to the hair.

25 To solve such problems, encapsulation has been developed in the art. Many prior patents have disclosed methods for producing microcapsules including water insoluble substances therein and hair care compositions containing the microcapsules. For example, Japanese Examined Patent Publication No. (Sho)46-38244 discloses a method of treating a capsule wall
30 membrane such as gelatin with a cross-linking agent such as formaldehyde

and glutaraldehyde, followed by drying and heating at a temperature of 120°C to 150°C. Japanese Unexamined Patent Publication No. (Sho)56-100630 discloses a method of treating an aqueous dispersion containing a capsule having a wall membrane of polyvinyl alcohol with, for example, acids and dialdehydes such as glyoxal and glutaraldehyde; or acids and urea and/or melanine and formaldehyde; or alkali and divinylsulfone and/or methylvinyl ketone; or alkali and epichlorohydrin. Japanese Unexamined Patent Publication No. (Sho)56-100631 discloses a method of treating an aqueous dispersion containing a capsule having a wall membrane of polyvinyl alcohol with an organic titanium compound such as diisopropoxy titanium bisacetyl acetone and aminoalcohol titanium chelate. EP Publication No. 0590538 A1 discloses a transparent leave-on hair treatment composition including capsules of a water insoluble hair-treating compound encased in a shell material such as gelatin or acacia gum. U.S. Patent No. 5,185,155 discloses a process for producing capsules containing a hydrophobic material with the use of silica particles whose size are all not greater than 100nm. U.S. Patent No. 4,115,315 discloses a process for producing capsules having pearlescent properties by the incorporation of pearlescent particles in the capsule walls thereof. U.S. Patent No. 3,607,775 discloses minute capsules having walls which comprise a complex of at least two polymeric materials originally having opposite net electrical charges, with at least one of these polymeric materials being autogenously polymerizable to a solid polymeric material insoluble in the manufacturing vehicle. EP Publication No. 0332175 A2 discloses a method of producing a microcapsule capable of protecting a core substance by completely blocking a permeation of foreign materials, and having a high safety factor with respect to the human body.

As described above, most prior techniques for encapsulation do not cover aspects for keeping capsules homogenously and stably dispersed in the shampoo compositions.

For shampoo compositions containing encapsulated oily substances produced according to the aforementioned prior techniques, our experiments revealed that capsules in the diameter of about 0.3mm or more floated on the upper phase of the shampoo system or precipitated to the bottom of the shampoo system. Moreover, some of capsules ruptured which lead to the release of oily substances into the shampoo system, which resulted in a considerable reduction of conditioning and esthetic properties.

There are few exemplary patents relating to techniques for the dispersion of particles having diameters of approximately 10 μ m or less, for examples, U.S. Patent No. 4,854,333 or 4,345,080, EP Publication Nos. 0285388, 0312234 or 0422508, and UK Patent No. 2187197. However, upon our examination of shampoo compositions produced as disclosed in such patents, we found that capsules containing oily substances were unsatisfactorily dispersed in the shampoo systems. Specifically, using the patented techniques, it was impossible to stably disperse capsules containing oily substances, with the specific gravity of the capsules being 0.5-0.95 at 25 $^{\circ}$ C, into the shampoo systems.

Accordingly, the object of the present invention is to solve the above described problems and to provide an improved shampoo composition in which capsules containing oily substances are stably dispersed for a long period. The inventors developed a new shampoo system which ensures satisfactorily endured dispersion and stability of capsules containing oily substances therein.

SUMMARY OF THE INVENTION

The present invention relates to a shampoo composition containing capsulated

or particulated oily substances, characterized by containing PVM/MA Decadiene Crosspolymer in amount from 0.15% to 2.0% by weight of the composition as a dispersing agent. The present shampoo compositions provide excellent conditioning and esthetic properties for hair in that the capsules or particles containing oily substances are stably dispersed therein. Since the present shampoo compositions ensure the stable dispersion of the capsules or particles for a long period, it is also advantageous in terms of storage. Additionally, since the present shampoo compositions retain a viscosity ranging from 4,000cps to 20,000cps at 25°C, it can be used conveniently.

DETAILED DESCRIPTION OF THE INVENTION

In the preferred embodiment, the present invention provides a shampoo composition which includes the following by weight of the composition:

- (a) from 0.05% to 10.0% of capsules or particles containing oily substances;
- (b) from 5% to 65% of surfactants selected from anionic and amphoteric surfactants and mixtures thereof;
- (c) from 0.15% to 2% of PVM/MA decadiene crosspolymer;
- (d) from 0.5% to 10.0% of alkanolamides of fatty acids;
- (e) from 0.1% to 2.0% of polymeric conditioners;
- (f) from 0.1% to 4.0% of salts of alkylmethylammonium; and
- (g) from 0.15% to 2.0% of non-volatile silicones or fatty alcohols.

The capsules or particles according to the present invention has a diameter from 0.2mm to 6.0mm. Preferably, the diameter of the capsules or particles ranges from 0.3mm to 3.0mm. The thickness of the capsule walls is optional as far as the capsules are not ruptured in the system, but preferably ranges from 50µm to 1,500µm. The more preferable thickness is from 100µm

to 700 μ m. The material of the capsule walls may be selected among a group consisting of agar, alginate, gelatin, polyamide, lactose, cellulose and derivatives thereof, and mixtures thereof. The possible amount of the capsules or particles ranges from 0.05% to 10.0% by weight of the shampoo composition, preferably from 0.15% to 6.0%.

The oily substances contained in capsules or as particles include mineral oils (e.g., liquid paraffin), lipid-soluble vitamin (e.g., vitamin E, vitamin A and derivatives thereof), ester oils (e.g., jojoba oil), some plant essential or cushion oils (e.g., meadowfoam oil and camellia oil) and animal oils (e.g., emu oil).

As a cleansing component, a combination of anionic and amphoteric surfactants is contained in the present shampoo composition. The anionic surfactants may be selected from a wide variety of alkylsulfates, carboxylates, proteins and amino acids. If the anionic surfactants have C₈₋₂₂ alkyl group or ethylene oxide group thereof, these materials are used as salts with sodium, ammonium, potassium or triethanolamine. The anionic surfactants can be used in amounts from 4% to 30% by weight of the composition, preferably from 8% to 20%. Illustrative of the amphoteric surfactants used, are, for example, betaines (e.g., cocamidopropyl betaine), sultaines (e.g., cocamidopropyl sultaine) and imidazols (e.g., cocoamphocarboxyglycinate). These materials can be used in amount from 1.5% to 10% by weight of the composition, preferably from 2% to 6%. When the combined ratio of anionic surfactants to amphoteric surfactants ranges from 2:1 to 3:1, antiirritating and conditioning effects are expected.

The alkanolamides of fatty acids contained in the present shampoo composition as thickner and/or foamstabilizer include mono or diethanolamide of fatty acids having from 8 to 12 carbon atoms. The preferable examples are

lauric diethanolamide, cocamidodiethanolamide, lauroylmiristoyldiethanolamide or cocamidomonoethanolamine, which can be used alone or in mixtures thereof. The preferable amount ranges from 1.5% to 6.0% by weight of the composition.

5

The polymeric conditioner contained in the present composition may be selected from polyquaternium-10 (Polymer-JR from UCC), guahydroxypropyl-triammonium chloride (Jaguar C-13S from Rhone-Poulenc), polyquaternium-7 -(Merquat -550 from Calgon) or mixtures thereof. The preferable amount

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The non-volatile silicone contained in the present composition as conditioner may be selected from a group consisting of dimethicone, dimethicone copolyol, amodimethicone and mixtures thereof.

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The fatty alcohols used in the present composition may be selected from a group consisting of cetyl, stearyl and behenyl alcohols and mixtures thereof. Not only do these materials impart thixotrophy to the shampoo system but also provide gloss to the hair.

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To improve consumer acceptability, minor ingredients such as pH regulating agents, humectants, perfumes, dyes and coloring agents can also be added to the present composition. Such conventional ingredients are well known to those skilled in the art.

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A pH regulating agent may be added to neutralize the dispersing agent dissolved and thus to ensure the stability of the shampoo system. The useful pH regulating agent includes but is not limited to mono, di and triethanolamine, sodium hydroxide and potassium hydroxide may be

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exemplified. These materials are used in amounts to render the pH of the

composition to be in the range of 5.0 and 7.7.

5 As suspending and/or pearl agents, glycolstearate may be used in amount from 0.3% to 2.5% by weight of the composition and titanated mica may be used in amount from 0.01 to 0.8% by weight of the composition.

Proteineous hair nutrients and/or physiologically active substances capable of protecting hair or skin, and antioxidants and/or ultraviolet-blocking agents may also be added to the present shampoo composition.

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The following examples are given merely as illustrations of the present invention and are not to be considered as limiting. Unless otherwise noted, the percentages therein and throughout the application are by weight.

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Examples 1 to 4

The following shampoo compositions are prepared:

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	Ingredients	Examples			
		1	2	3	4
Dispersing Agent-Premix	¹⁹ PVM/MA Decadiene Crosspolymer(5%)	3.0	8.0	10.0	20.0
Conditioner-Premix	Polyquaternium-10(4%)	-	-	5.0	5.0
	Cationic Guar Gum(3%)	10.0	5.0	-	-
Cleansing Agent	Ammonium lauryl sulfate(30%)	20.0	-	20.0	-
	Sodium lauryl ether sulfate(30%)	25.0	25.0	25.0	25.0
	Triethanolamine lauryl sulfate(30%)	-	20.0	-	20.0
	Cocamidopropyl betaine(37%)	5.0	5.0	-	-
	Cocoamphocarboxy glycinate(48%)	-	-	4.0	4.0
Suspending Agent	Glycol stearate	1.0	1.0	0.5	0.5
Conditioner	Alkyltrimethylamm- onium chloride(50%)	1.0	1.0	0.5	0.5
	Cetyl alcohol	0.5	0.5	0.25	0.25
	Dimethicone	0.5	1.0	-	-
pH Regulating Agent	Triethanolamine	pH6.0	pH5.5		
	NaOH(10%)			pH6.5	pH7.0
Humectant	Propylene glycol	2.0	1.0	-	-
	Hexylene glycol	-	-	2.5	1.0
Thickner/ Foamstabilizer	Cocamide DEA	4.0	3.0	-	-
	Lauramide DEA	-	-	2.5	3.0
Capsule/Particle	²¹ Unisphere	0.3	-	-	-
	³¹ Nikkol AC	-	1.0	-	-
	³¹ LipoPearl	-	-	3.0	-
	³¹ Millisphere	-	-	1.0	-
	³¹ Millicapsule	-	-	-	6.0
Hair Nutrients	Hydrolyzed animal protein	0.3	0.3	0.3	0.3
Additives	Perfume	q.s.	q.s.	q.s.	q.s.
	CaCl ₂ /MgSO ₄	-	-	0.12/ 0.15	-
	Preservatives	q.s.	q.s.	q.s.	q.s.
	Water	to 100	to 100	to 100	to 100

¹PVM/MA Decadiene Crosspolymer: crosslinked copolymer of methyl vinyl ether/maleic anhydride, Stabileze-06TM available from ISP, USA.

5 ²Unisphere: from 0.3mm to 1.0mm particles consisting of lactose, cellulose, hydroxymethylcellulose and lipid-soluble vitamin derivatives, available from Induchem, Switzeland.

10 ³Nikkol AC: capsule with diameter of 0.5-1.5mm whose wall consists of agar and alginate and in which lipid-soluble vitamins and cushion plant oils such as macadaia oil, meadowfoam oil, jojoba oil and camellia oil are, alone or in combination with the two or more, incorporated, available from Nikko Chemical, Japan.

15 ⁴LipoPearl: capsule with diameter of 0.8-5mm whose wall consists of animal gelatines and in which animal oils, lipid-soluble vitamins and mineral oils such as liquid paraffin are, alone or in combination with the two or more, incorporated, available from Lipo Technology, USA.

20 ⁵Millisphere: sphere having diameter of 0.5-5.0mm and consisting of alginate, wherein animal and plant oils and lipid-soluble vitamins are incorporated, available from Solabia, France.

25 ⁶Millicapsule: capsule with diameter of 1.0-4mm whose wall consists of polyamides and in which light mineral oils are incorporated, available from Lipotec, USA.

The shampoo compositions are prepared through the following steps:

30 step 1- PVM/MA decadiene crosspolymer powder is mixed with an appropriate amonut of water in a bath equipped with heater and then

the resulting mixture is stirred with increased rate of stirring and by heating to 60°C or more to produce a homogenous solution (dispersing agent-premix). Separately, polyquaternium-10 and cationic guar gum is dispersed in water at low temperature and subsequently is stirred at high temperature to produce a homogenous solution (conditioner-premix).

step 2- The dispersing agent-premix, conditioner-premix and cleansing agent are poured, while stirring, into a batch in which an appropriate amount of water has been previously contained.

step 3- The suspending agent is added and dissolved by stirring and heating to the temperature of 65°C or more. After the resulting solution is cooled to the temperature of about 50°C, the conditioners are added therein.

step 4- The humectants and pH regulating agents are together added and stirred to adjust the desired pH of the solution.

step 5- The thickeners and foamstabilizers are added and stirred to stabilize the system. At this stage, the temperature of the solution is kept to about 45°C.

step 6- The capsules are added and stirred slowly and gently without any damage. At this stage, if desired, sodium chloride can be incorporated.

step 7- The resulting solution is cooled to the temperature of about 35°C and then the hair nutrient is added while stirring.

step 8- The preservatives, perfumes and coloring agents are added along with a remaining portion of water and stirred to obtain the desired shampoo composition.

Comparative Examples 1 to 4

As comparison of stability, the following shampoo compositions are prepared:

	Ingredients	Comparative Examples			
		1	2	3	4
Dispersing Agent-Premix	Carbomer(4%)	35.0	-	-	-
	Xanthan Gum(3%)	-	40.0	-	-
	Carrageenan(3%)	-	-	40.0	-
	Hydroxyethyl cellulose(2%)	-	-	-	15.0
	Magnesiumaluminium silicate(2%)	-	-	-	20.0
Conditioner-Premix	Polyquaternium-10(4%)	-	5.0	5.0	-
	Cationic Guar Gum(3%)	10.0	-	-	10.0
Cleansing Agent	Ammonium lauryl sulfate(30%)	20.0	20.0	20.0	20.0
	Sodium lauryl ether sulfate(30%)	25.0	25.0	25.0	25.0
	Cocamidopropyl betaine(37%)	5.0	-	5.0	-
	Cocoamphocarboxy glycinate(48%)	-	4.0	-	4.0
Thickner	Cocamide DEA	3.5	3.5	-	-
	Lauramide DEA	-	-	3.5	3.5
	Cetyl alcohol	0.25	0.25	-	0.25
Capsule	Oil capsule(1-2mm)	1.3	1.3	1.3	1.3
Suspending Agent	Glycol stearate	1.0	1.0	1.0	1.0
pH Regulating Agent	Triethanolamine	-	-	-	pH7.0
	NaOH(10%)	pH7.0	-	-	-
Humectant	Pyrolidone carboxylic acid-Na	0.5	-	-	1.0
	Propylene glycol	-	1.5	1.5	-
Conditioner	Alkyltrimethylamm-onium chloride(50%)	1.0	1.0	1.0	1.0
	Dimethicone	0.5	0.5	0.5	0.5
	Hydrolyzed animal protein	0.3	0.3	0.3	0.3
Additives	Perfume	q.s.	q.s.	q.s.	q.s.
	Preservatives	q.s.	q.s.	q.s.	q.s.
	Citric acid	q.s.	q.s.	q.s.	q.s.
	Water	to 100	to 100	to 100	to 100

The control shampoo compositions are prepared through a similar procedure as described in Examples 1-4.

The Dispersing agent-Premix and Conditioner-Premix are independently prepared as follows. The carbomer powder (Carbopol-1342 from B.F.Goodrich) is dispersed in water at a high temperature while stirring at a high rate and is dissolved by heating to 60°C and stirring to produce a homogenous solution. Homogenous solutions of xanthan gum or carrageenan can be produced by continuously stirring at a high rate. Homogenous solutions of hydroxyethylcellulose or magnesiumaluminiumsilicate (Veegum HV from R.T. Vanderbilt) can be produced by dispersing the material powders in water while heating to 80°C and stirring at a high rate and subsequently cooling the resulting dispersion to room temperature. The polyquaternium- (Polymer-JR400 from UCC) or cationic guar gum (Jaguar C-13S from Rhone-Poulenc) are dispersed in water at low temperature and dissolved at a high temperature by stirring to produce the conditioner-premix.

The surfactants (cleansing agents) and water are incorporated together into a batch while slowly stirring. Then, the dispersing agent-premix and conditioner-premix are added while heating to 65°C. Subsequently, thickeners, suspending agent, humectants, pH regulating agents, encapsulated oily substances, conditioners and other additives are added in appropriate sequences to produce the shampoo compositions.

25 Stability Test

While each shampoo prepared by the above Examples was stored at 5°C, room temperature(RT) and 45°C for three months, stability was observed once every two days. In addition, after each shampoo was stored at -10°C for 24 hours and 45°C for another 24 hours during a three month period (freeze

& thaw test), stability was observed once every two days. The results are shown in Tabel 1 below.

Table 1

	Examples				Comparative Examples			
	1	2	3	4	6	7	8	9
5°C	stable over 3 months	stable over 3 months	stable over 3 months	stable over 3 months	capsule floated after 6 days	capsule floated after 6 days	stable over 3 months	capsule floated after 4 days
RT	stable over 3 months	stable over 3 months	stable over 3 months	stable over 3 months	capsule floated after 6 days	capsule floated after 4 days	stable for 10 weeks	capsule floated after 6 days
45°C	stable over 3 months	stable over 3 months	stable over 3 months	stable over 3 months	capsule floated after 2 days	capsule floated after 6 days	stable for 10 weeks	capsule floated after 2 days
F&T	stable for 6 weeks	stable for 2 months	stable for 2 months	stable over 3 months	capsule floated after 1 cycle	capsule floated after 1 cycle	stable for 5 weeks	capsule floated after 1 cycle

25 the above results, it is demonstrated that the shampoo compositions according to the present invention have remarkably superior stability. In contrast, the comparative shampoo compositions are less stable since the phases of the capsules containing oily substances are formed within a week. Although the shampoo composition of Comparative Example 3 shows
30 relatively good stability, it is less stable than the present shampoo composition and it would have an adverse effect on the hair since it contains carrageenan.

Comparative Examples 5-9

To compare performance, the plain shampoo compositions (Comparative Examples 5 and 6) and the conditioning ampoo compositions (Comparative Examples 7, 8 and 9) are prepared:

	Comparative Examples				
	1	2	3	4	5
Sodium lauryl sulfate(30%)	15.0	-	-	-	-
Sodium lauryl ether sulfate(30%)	25.0	-	25.0	25.0	25.0
Ammonium lauryl sulfate(30%)	-	20.0	20.0	20.0	25.0
Ammonium lauryl ether sulfate(30%)	-	25.0	-	-	-
Triethanolamine lauryl sulfate(30%)	5.0	-	-	-	-
Cocamidopropyl betaine(37%)	5.0	-	5.0	4.0	-
Cocoamphocarboxyglycinate(48%)	-	4.0	-	4.0	-
Cocamide DEA	3.5	3.5	3.0	3.5	3.5
Cationic Guar Gum	-	-	-	-	0.3
Polyquaternium-10	0.3	0.3	-	-	-
Carbomer	-	-	-	0.5	0.25
Triethanolamine	-	-	-	-	-
Xanthan Gum	-	-	0.35	-	-
Glycol Stearate	-	1.0	1.0	1.0	1.0
Propylene Glycol	1.5	1.5	1.0	1.0	1.0
Hydrolyzed Animal Protein	0.3	0.3	0.4	0.4	0.4
Cetyl Alcohol	-	-	0.2	0.2	0.2
Dimethicone	-	-	1.0	1.0	1.0
alkyltrimethylammoniumchloride(50%)	-	-	-	1.0	1.0
Preservatives	q.s.	q.s.	q.s.	q.s.	q.s.
Perfume	q.s.	q.s.	q.s.	q.s.	q.s.
Citric Acid	q.s.	q.s.	q.s.	q.s.	q.s.
Coloring Agent	q.s.	q.s.	q.s.	q.s.	q.s.
Water	to 100	to 100	to 100	to 100	to 100

The comparative shampoo compositions are prepared as described in Examples 1 through 4.

Performance Test

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After each sample of shampoo compositions, as prepared in Examples 1-4 and Comparative Examples 5-9, was applied for 3 weeks, 2 to 5 times each week to twenty five(25) women who were between the ages of 18 to

40, testing was conducted regarding foamability, feeling for shampoo, rinse ability, combability after briefly drying the hair, conditioning of the hair after it was dried, elasticity and volume-up of the hair after it was dried. Each performance was tested on a seven degrading scale (seven being the highest score) and the results of the test are shown in Table 2 below. The marks were obtained by averaging results of the 25 women.

Table 2

	Examples				Comparative Examples				
	1	2	3	4	5	6	7	8	9
Foamability	4.0	4.2	4.2	4.3	4.5	3.9	3.8	3.4	3.5
Feeling	4.5	5.7	5.8	5.8	3.4	3.2	3.8	3.9	4.1
Linse ability	4.7	5.4	5.3	5.4	2.8	3.6	4.3	4.0	4.3
Combability	4.3	4.8	5.5	5.3	3.2	3.3	3.1	4.1	4.0
Conditioning	4.9	5.5	5.9	5.9	3.4	3.4	3.6	3.7	4.1
Elasticity & Volume-up	5.0	5.4	5.6	6.0	3.2	3.1	3.5	3.3	3.3

The above results show that the shampoo compositions of Examples 1 through 4 keep capsules containing oily substances stably and homogeneously dispersed and therefore have excellent performance by successfully applying oily substances encapsulated to the hair.

WHAT IS CLAIMED IS:

1. A shampoo composition comprising from 0.05% to 10% by weight of capsules or particles including oily substances and from 0.15% to 2% by weight of PVM/MA Decadiene Crosspolymer.
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2. The shampoo composition according to claim 1 wherein the capsules or particles are contained in amount from 0.15% to 6.0% by weight and the PVM/MA Decadiene Crosspolymer are contained in amount from 0.2% to 1.3% by weight.
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3. The shampoo composition according to claims 1 or 2, containing from 5% to 65% by weight of surfactant selected from anionic and amphoteric surfactants and mixtures thereof, from 0.5% to 10% by weight of alkanolamide of fatty acid, from 0.1% to 2% by weight of polymeric conditioner, from 0.1% to 4% by weight of salt of alkylmethylammonium and from 0.15% to 2% by weight of non-volatile silicone or fatty alcohol.
15
4. The composition according to claim 3, containing diethanolamine, triethanolamine, sodium hydroxide or potassium hydroxide.
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5. The composition according to claim 3 wherein the alkanolamide of fatty acid is selected from a group consisting of mono and dialkanolamide of fatty acids having from 8 to 14 carbon atoms and mixtures thereof.
25
6. The composition according to claim 3 wherein the salt of alkylmethylammonium is selected from a group consisting of alkyltrimethylammonium chloride, dialkyldimethylammonium chloride, tricetylmethylammonium chloride and mixtures thereof and has from 10 to 24 carbons.
30

7. The composition according to claim 3, containing dimethicone, amodimethicone, dimethicone copolyol or mixtures thereof.
8. The composition according to claim 3 wherein the fatty alcohol has from
5 10 to 24 carbons.
9. The composition according to claims 1 or 2 wherein the oily substance incorporated in capsule or particle is selected from a group consisting of liquid paraffin and derivatives thereof, vitamin A and E and derivatives,
10 meadowfoam oil, jojoba oil, macadamia nut oil, cushion oil and emu oil and mixtures thereof.
10. The composition according to claims 1 or 2 wherein the capsule wall is made of any of a group consisting of agar, alginate, gelatine, polyamide,
15 lactose, cellulose and derivatives thereof or mixtures thereof.
11. The composition according to claim 8 wherein the thickness of the capsule wall is from 50 μ m to 500 μ m.
12. The composition according to claim 8 wherein the diameter of the capsule
20 is from 0.3mm to 3.0mm.
13. The composition according to claims 1 or 2 wherein the pH of the composition is from 5.0 to 7.7.
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR 96/00244

A. CLASSIFICATION OF SUBJECT MATTER

IPC⁶: A 61 K 7/075

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁶: A 61 K 7/00, 7/075, 7/08

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	EP 0 590 538 A1 (HELEN CURTIS) 06 April 1994 (06.04.94), page 4, line 41 - page 9, line 42.	1-13
Y	Römpp Chemie Lexikon, Vol.2, Stuttgart: Georg Thieme Verlag, 1990, page 1482 "Gamtretz AN".	1-13
Y	EP 0 468 721 A1 (UNILEVER PLC) 29 January 1992 (29.01.92), totality.	1-13
A	US 5 118 498 A (M.W.HELIOFF et al.) 02 June 1992 (02.06.92), totality.	1-13

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, each combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

17 March 1997 (17.03.97)

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Name and mailing address of the ISA/AT
AUSTRIAN PATENT OFFICE
Kohlmarkt 8-10
A-1014 Vienna
Facsimile No. 1/53424/535

Authorized officer

Irmeler

Telephone No. 1/5337058/34

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR 96/00244

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